Mineral Resources

●135 The distribution of minerals in Ukraine is most favorable. The most important supplies are in the midst of areas that are valuable from the point of view of agriculture: coal and salt in the Donets Basin, iron and manganese ore at the Bend of the Dnipro. Even the minerals in the Carpathians and the Caucasus (oil etc.), in spite of their remoteness from the center of the country, have fertile foreland in the vicinity.

There are secondary deposits scattered throughout the country (lignite, kaolin, peat etc.). In general, the mineral supplies of Ukraine are easy to get at; the problem of transportation is more easily solved than in Russia and there is little difference between geological deposits and those worth exploiting. In the last 30 years much progress has been made in mineral surveys, not that extensive new deposits have been discovered, but investigation of deposits already known has led to intensive operation of these.

In Ukraine, minerals occur over a large area and at no great depth. It is a disadvantage that productive layers are often limited and unevenly distributed; there are "dead" intervals and sometimes impurities that detract from quality; these faults are not present in the most important deposits of iron ore at Kryvyj Rih.

1. Main Minerals and Areas of Occurrence

Ukraine is richer in sources of fuel and power than most European countries. We only need mention the sole great coal deposit in Eastern Europe in the Donets Basin. The oil wells in the foothills on both wings of the Ukrainian territory are exposed from the point of view of strategy. Wood alone must be imported. There are many sources of water power, even if they are not very significant.

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Metals are very unevenly distributed. While there is but a small quantity of non-precious metals, the abundance of ores for heavy iron industry assure for Ukraine an eminent place among the ore-producing countries of the world and it is even first as a producer of manganese ore. There are generous deposits of alumina, among others kaolin, salt, graphite and building materials, though one would not think so from the wretched condition of the roads. 135

The mineral wealth of the country is distributed as follows:

1) In the Donets Basin: coal, rock and other salt, some iron and other ores, including mercury, phosphorite, kaolin, fire-proof alumina, many small deposits of other metals, limestone, marl, dolomite, chalk, quartz sand, building stone etc.
2) In the Dnipro Bend on Right Bank: iron ore at Kryvyj Rih and manganese ore at Nikopil; also graphite, ochre, brown coal, kaolin.
3) In the foreland of the Caucasus: petroleum, some coal, lead, tin and iron ores, many small deposits of non-precious minerals, largish deposits of cement, rich deposits of iron ore on the Kerch Peninsula.
4) In the Carpathians: petroleum, mineral wax, salt (also on south side), potassium, manganese ore, some iron ore, graphite, brown coal etc.

A small part of the coal deposit on the Donets spreads on to territory that is not Ukrainian. But, otherwise, all this mineral wealth is in Ukrainian soil, even if the influx of foreign labor has led to a decline in the Ukrainian population in some localities.

Such factors determine the place of Ukraine in the world sources of petroleum. The Galician oilfields are in ancient Ukrainian territory, but long Polish pressure has won the upper hand in a small part of the oilfields of Jaslo in the west. The oilfields in the Kuban area lie in territory that was long ago colonised by Ukraine, whereas the colonising process is still active in the Terek areas. The Groznyj petroleum field in North Caucasia has not yet been colonised by Ukrainians and, like many industrial areas, forms a Russian island that is miles away from contiguous Russian territories. If Ukraine claims Groznyj, it is

● 135 giving expression to a certain territorial theory, but above all to the natural ambition of a colonising nation to penetrate and hold the entire area it has settled.

2. Coal

Coal has recently been discovered outside of the Donets Basin 30 kilometers from Lviv, at Kaminka Strumylova, Sokal and Zadviria; the extent of this coalfield has not yet been determined.

In North Caucasia, where the entire coal has been estimated at 740 million t, 96 millions having beeen definitely established, the deposits south of Batalpashynske on the upper reaches of the Kuban and its tributaries are known to exist though there has been little prospecting. The deposit is usually estimated at 115 million t, while 38 million t have actually been proved to exist (the calorific value is low, viz. 6900 for coal from the best known coalfields and 7900 for those of best quality). The deposits at Koushin, Balaclava and Telenejir in the Crimea, estimated at 340 million t, are not first rate either.

The coal fields on the Don lie on the right bank of the lower reaches of the river from the district of Izium to where it flows into the Don. They have an area of 23000 sq. kilometers compared with the 3000 sq. kilometers of the Ruhr area which is richer in coal. The seams are fairly shallow, practically indeed on the surface (compared to the 350 meters depth in Upper Silesia). The average depth of the mine-shaft is 146 meters while in the Ruhr it is more than 600 meters and in the most important English mines 312 meters. The cost of bringing the coal to the surface is therefore relatively low.

The average thickness of the seams is scarcely ¾ meters, twice or three times less than in the Ruhr area or in the Kusnets Basin in Siberia. They run unevenly and are not continuous. The Donets coal contains more impurities and 10—14 % ash, compared with 8—9 % in Germany and 7—10 % in the „Kusbas" and its sulphur content is also greater (almost 2 % compared with 1.2 % and 0.5 % respectively). These are disadvantages for the carbonisation process.

At the Geological Conference in Toronto in 1913 the coal resources of the Donets Basin were estimated at 55.6 milliard t.

Table 4. Coal Resources in Leading Countries

	Anthracite		Coal		Brown coal		Altogether		Europe
	Mrd. t	% World	Mrd. t	% World	Mrd. t	% World	Mrd. t	% World	%
1. USA	19,7	3,4	1956	47,2	1863	64,0	3839	50,2	(480)
2. China	388,0	66,1	607	14,6	0,6	—	996	13,0	(154)
3. Canada	2,1	0,4	284	6,9	948	32,6	1234	16,1	(125)
4. Soviet Union	128,0	21,8	332	8,0	20,0	0,7	480	6,3	(59)
(Asiatic area)	(107,0)	Europe	(284)	Europe	(7,1)	Europe	(398)	(5,2)	—
(European area)	(20,8)	55,7	(48)	(6.7	(12,9)	(25,3)	(77)	(1,0)	9,6
5. Germany	—	—	430	60.0	26,0	51,0	456	6,0	57,0
(Poland)	—	—	(170)	(23,7)	—	—	(170)	(2,2)	(21,2)
6. England	11,4	30,5	178	24,9	—	—	190	2,5	23,8
7. Ukraine	11,8	31,6	43	6,0	5,0	9,8	60	0,7	7,5
8. France	3,3	8,8	29	4,1	1,6	3,1	34	0,5	4,3
9. Belgium	—	—	11	1,5	—	—	11		1,4
10. Spitzbergen	—	—	8,8	1,2	—	—	8,8	0,5	1,1
11. Spain	1,6	4,3	6,4	0,9	0,8	1,8	8,8		1,1
12. Holland	0,3	0,8	4,1	0.6	—	—	4,4		0,6
Europe	37	6,3	716	17,3	47	1,6	800	10,5	100
Asia	514	87,6	978	23,6	12	0,4	1505	29,7	(188)
North America	22	3,7	2240	54,0	2812	96,7	5073	66,4	(634)
South America	1	0,2	31	0,8	—	—	32	0,4	(4)
Africa	12	2,0	45	1,1	1	—	58	0,8	(7)
Australia	1	0,2	133	3,2	35	1,2	169	2,2	(21)
World	590	100	4140	100	2910	100	7640	100	(965)

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Table 5. Coal Resources in 9 Largest Coaling Areas of World.

● 135

Area	Country	Principal kind of coal	mrd. t	% of world	% of total
1. Alberta Saskatchewan	Canada	brown coal	1119	14,6	34,6
2. Shangsi	China	coal & anthracite	714	9,3	22,1
3. Appalachians	USA	coal	551	7,2	17,0
4. Kusnets Basin	Western Siberia	coal	250	3,3	7,7
5. Ruhr	Germany	coal	214	2,8	6,6
6. Upper Silesia	Germany	coal	196	2,6	6,1
7. Donets Basin	Ukraine	coal & anthracite	69	0,9	2,1
8. Cheremkhowo	East Siberia	different varieties	66	0,9	2,0
9. Yorkshire	England	coal	56	0,7	1,7
Total			3235	42,4	100

Since then newly prospected areas have been added, the process of extension being not yet completed. In 1937 stocks were estimated at 89 mrd. t; but the figure for 1927, 69 mrd. t, calculated for a depth of 1 500 meters is more exact. $^2/_3$ of the coalfields, but much more than $^3/_4$ of the coal supplies (54.3 mrd. t) are in Ukrainian territory. As a producer of coal Ukraine is 7th in the countries of the world and 3rd in Europe.

There are many varieties of coal in the Donets Basin; bituminous, gas and furnace coal are mostly found in the coalfields of the west and the center, while porous coal and anthracite are also found in the eastern fields (the latter represent 30 % of the entire deposit). The 21 mrd. t anthracite here is far more than that found in all the other countries of Europe (17 milliard t). Bituminous coal constitutes less than $^1/_4$ of the Donets deposits.

3. Petroleum

Up to date no great quantities of petroleum have been discovered in Central Ukraine. The natural gas at Melitopil is evidence of petroleum at great depth. During prospective of salt mines in the Left Bank Region, petroleum has also been found.

The Galician oilfields stretch 400 km along the north flank of the Carpathians from Dunajec and the Duklapass to Buco-

vina and cover an area of 10 000 ha. The Jaslo oilfield is west of the Syan, while the main fields of Drohobych with wells at Boryslav, Tustanovychi, Skhidnytsia, Mraznytsia lie east of the same river and the Bytkiv field is in the south-east. 135

The petroleum in these fields lies far below the surface, 1.000 meters deep in Boryslav and often more than 1 300 meters. Geological conditions make it difficult to exploit the wells, although the upper layers are firmer than those in North Caucasia and the deposits are more concentrated. South of the Carpathians there are insignificant deposits which, however, have perhaps not been sufficiently investigated.

The deposits in the Kuban area are distributed over a wide surface in 7—10 fields from the Taman Peninsula via Maikop, the center of the oil industry to the Laba. Up till now this area has only been ¼ prospected (22.5 % in 1935). The soil is sandy and the petroleum lies 700 metres deep.

The oilfields of Groznyj lie in the north-east slopes of the Caucasus, on the southern bank of the Terek river. Geological conditions are not favorable and have not been adequately prospected (26 %).

Judged by European standards at least, the stores of petroleum in Ukraine are considerable. Resources in Galicia are estimated at 100 million t, and in the Kuban area at 66—82 million t (but also at far more than the Galician figure), the Groznyj fields are estimated to contain 208—1290 million t. It is true that more recent estimates for North Caucasia are more modest (240 million t in all); nevertheless, Ukraine ranks high among the oil producing countries of the globe.

The quality of the petroleum varies. In Galicia it is mostly of medium weight (specific weight: 0.825—0.835 g); it provides 5—12 % of light fractions, mainly benzine, 51—56 of medium, above all gas for lighting and only 24—30 % of heavy lubricating oils, such as masut, vaseline and the oils with up to 6 % paraffin, which are characteristic for Galicia. In many fields the percentage of benzine is much higher. In the Kuban area there is still more variety between the different fields. Maikop petroleum is lighter than Galician (0.805—0.835 g), contains no paraffin,

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135 but more benzine (8—15 %) and even 30 % in the newer fields; Groznyj petroleum is particularly rich in benzine.

It also contains paraffin, but a relatively small percentage of the medium fractions. As a comparison we may quote Pennsylvanian oil (0.791—0.812 g specific weight) which, at a first distillation, yields 10—20 % benzine, 60—75 % medium and only 5—10 % heavy fractions. Baku oil has a specific weight of more than 0.870; it provides 5—7 % benzine, 27—33 % medium and 56 bis 65 % heavy fractions. Galician oil is midway between these two extremes while the varieties in North Caucasia belong rather to the lighter oils.

Mineral wax occurs at Boryslav and some other places in Galicia, but is otherwise very rare throughout the world.

Natural gas is found unaccompanied at Melitopil, Kerch, and in many places in North Caucasia, and otherwise it appears along with oil. It contains 70—97 % methane and also naphtaline, sulphur and other substances that can be used. It has, however, been little investigated and is used only in Galicia for long-distance heating and lighting, but otherwise only locally (8 500—9 000 calories).

4. Other Fuels and Sources of Power

In the Right Bank Region which is so valuable from the agricultural point of view, brown coal is the most abundant fuel. South of the Kyiv district there are the well-known deposits at Katerynopil, Jurkivka, Zhuravka, etc. In the Kirovohrad district (Jelizavethrad) there are those at Balashivka, Katerynivka, etc. In the surroundings of Oleksandrija — Semenivka, Zelenove etc, in the Kryvyj Rih district — Saksahan, Veselo-Ternivka, Heylivka etc. These 4 or 5 groups form a chain, which is, however, not continuous.

The group of deposits in Volynia and Podolia (stocks 30 million t) is centered round the Galician towns of Potylych n .r Rava Ruska, Hlynsko and Skvaryava, and also appear at Kremianets in Volynia. There is a group of deposits in Subcarpathian Galicia (27 million t) at Myshyn, Dzhuriv, Novoselytsia etc, the coal being of superior quality and of higher calorific value (4 100 — 4 400). Soviet estimates for 1940, to

be accepted with caution, increase the entire deposit of brown coal in Galicia and Volynia (the Dnister Basin) of not quite 100 million t to approximetely 1 mrd. In Carpatho-Ukraine there are numerous smaller deposits, to give the better known names for instance in Antalivtsi, Bilky, Dovhe, Nerezhnytsia etc. There is brown coal also in other parts of Ukrainian territory, the brown coal deposits in Ukraine probably amount to some (5—6) mrd. tons. But only a part of the 150 deposits has been investigated and up till now scarcely 518 million tons of industrial deposits have been determined there. They lie at no great depth, though mostly between layers of sand which allow water to sicker through. Mining conditions are difficult. On the whole neither the quality nor the calorific value (a little more than 2 000 on an average) of this earthy brown coal is high (lignite is rare). But brown coal is very good for the manufacture of briquettes and the process increases its calorific value considerably (4 500 calories), and makes it far easier to transport. /35 ●

Peat, still more than brown coal, has the advantage of occurring in districts remote from coaling areas, above all in the north-east area of Ukraine. In some districts of Polesya there is peat over 1/3 of the entire surface. In the Kyiv district, the peat bogs on the river Irpen have long been known, as well as the extensive .marshes of the Irdyn on the river Tiasmyn etc.

The peat areas in Ukraine have not been intensively studied. It is estimated that in the central area of the Dnipro region, 1.9 million ha of bogland would produce peat and about 0.8 million ha in Western Ukraine. Taking only 3/4 of that area into consideration, 2.3 million ha represent about 4 % of the entire peat land in Europe (56 million ha). Ukrainian figures are very low compared with the peat resources of the northern areas that belong to USSR. The peat in Ukraine was estimated at approximately 4 mrd. t while the corresponding figure for USSR was perhaps 460 million t. But up till 1927 only 1/3 (35.5 %) of the Dnipro-Ukraine peat land mentioned was registered and only 1/6 has really been prospected.

376 Waterpower in Ukraine is estimated at about 12 million HP. Of this some 9.6 million is supplied by the mountain rivers of North Caucasia. The water-power of the Carpathian rivers is much less, but also less utilised. The fall of the rivers in Dnipro-Ukraine is, of course, incomparably less though they carry far more water. Their water-power is estimated at 1.4 million HP, more than $^2/_3$ being utilised while scarcely 10 % of the entire water-power in Ukraine is harnessed to industry. It is not, however, certain that all the power of the mountain rivers could be utilised for industrial purposes.

5. Iron Ores

(See Table 6)

● 135 Ukraine has small deposits of iron ore in practically all areas, also in Galicia and Carpatho-Ukraine. In the Kuban area the entire resources amount to almost 100 million t. As an important contributor to the history of production, the Donets Basin must also be mentioned. All those deposits have a local, if sometimes not inconsiderable, significance.

The iron ore deposit at Kryvyj Rih (Russian Kriwoi Rog) is the most important in Eastern Europe, both from the point of view of quality and quantity. The ore lies along the Inhulets, the last tributary on the right bank of the Dnipro, and along its tributaries, the Zhovta and the Saksahan, some 130—200 kilometers from the mouth of the Dnipro. They are found in a hollow some 100 kilometers long but very narrow (2—6—9 km) and are generally only prospected some 320 meters deep, although valuable iron ore was found at a depth of almost 500 meters.

The thickness of the individual layers of ore is, in the least favorable cases, 4—7 meters, but mostly 10—30, 45—65, and more rarely 100—150 meters. Before World War I deposits were estimated at 200—300 million t, which figure rose to 1245 million t by 1932. As this is superior red iron ore, the Kryvyj Rih deposit with a pure metal content of 540 million tons, far surpasses all other iron ore deposits in Eastern Europe, even if they contain more crude ore. The quality of

Table 6. Iron Deposits of Ukraine in Soviet Union

Deposit, District, Country	Iron ores					Quartzite					Total	
	Total Deposits in Mill. t.	% of total Deposits in Soviet Union	A+B Deposits in Mill. t	% of A+B Deposits in Soviet Union	% Share of A+B in total Deposits	Total Deposits in Mrd. t	% of total Deposits of Soviet Union	A+B Deposits in Mrd. t	% of A+B Deposits in Soviet Union	% Share of A+B total Deposits	Total ores and Quartzite in Mrd. t	% of Soviet Union
Kryvyj Rih	1491	13,7	669	14,8	45	51,3	20	10,7	91,5	21	52,8	20
Kerch	2722	25	1638	36,4	60	—	—	—	—	—	2,7	1
North Caucasia	115	1,1	37	0,8	32	—	—	—	—	—	0,1	—
Other Districts	2	—	1	—	—	1	—	—	—	—	1	—
Ukraine	4330	39,8	2345	52	54	52,3	20,4	10,7	91,5	20	56,6	21
Kursk	337	3,1	175	3,9	52	203,7	79	0,9	7,3	0,4	204	76
Choper Kalachoy	716	6,6	184	4,1	26	—	—	—	—	—	0,7	—
Tula-Lipets a. o.	484	4,5	219	4,8	45	—	—	—	—	—	0,5	—
Central Russia	1537	14,2	578	12,8	37	203,7	79	0,9	7,3	0,4	205,2	76,5
North	1065	9,7	28	0,6	3	0,5	0,2	0,1	0,8	20	1,5	0,5
Transcaucasia	200	1,8	178	4	87	—	—	—	—	—	0,2	—
European area of Soviet Union	7132	65,5	3129	69,4	44	256	99,6	11,7	99,6	4,5	263	98
Ural	2414	22,2	1169	26,1	48	—	—	—	—	—	24	0,9
Kasakstan, Central Asia	119	1,1	11	0,2	9	—	—	—	—	—	0,1	—
Western Siberia	415	3,8	111	2,5	27	—	—	—	—	—	0,4	—
East Siberia, Jakutia	707	6,5	71	1,5	10	—	—	—	—	—	0,7	—
Far East	94	0,9	15	0,3	16	—	—	—	—	—	0,1	—
Soviet Union in Asia	3748	34,5	1377	30,6	37	1	0,4	0,05	0,4	5	4,7	2
Soviet Union total in Mrd. t.	10,9	100	4,5	100	40	257	100	11,7	100	4,5	268	100

● 135 Kryvyj Rih ores has always been acknowledged. They consist of 95 % haematite, with a minimum iron content of 55 % which, however, has an average of 62 %, and are characterised by their great purity. There are only the slightest traces of sulphur, the phosphorus content is 0.017—0.037 % and in the best quality ores only 0.005 %. As one of the ores in Europe with least phosphorus, the Kryvyj Rih iron ore is particularly suited to the Bessemer process. Its lumpiness is also favorable, for it makes preliminary treatment superfluous.

There is a huge deposit of approximately 50 billion t of iron quartz with an average pure metal content of 35 %. Only part can be utilised for practical purposes. A technically and economically progressive and profitable solution of the problem of getting iron from quartzites would enormously enhance the value of the Kryvyj Rih deposits for industry. The iron quartzite deposits in Kursk which partly lie in Ukrainian territory are still more significant (208 mrd. t), while deposits of iron ore only amount to 343 million t.

Kerch in the north of the Crimea has the most important deposit of ore, as far as area (2400 sq. km) and quantity of ore are concerned. It covers almost the entire peninsula, along the Strait of the same name, from the Sea of Oziv to the Black Sea. The layers of ore are not deep (2—20 meters, usually but not more than 4 meters) and can easily be mined on the surface. They are 2—20 meters thick, mostly 8—12, and in some places, however, as thin as 0,2 meters. The iron ore deposits in Kerch have been well-known for some time and have been adequately prospected. Recent estimates put these deposits at 2 722 million t, which would exceed even the rich iron ore deposits in Minnesota USA. But the average pure metal content of the almost exclusively brown iron ore in Kerch is only 34—43 %, often, indeed, less than 40 %. So that Kerch, with 245 million t of pure iron content is far behind Kryvyj Rih, and also behind the Ural deposits (411 million t in 1932, figures in table are more recent).

From the point of view of present day engineering, the quality of Kerch iron ores is not very high. Its average phosphor

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content of 1 % means that the Thomas process only can be applied in the manufacture of steel, but it also contains 1.6 % sulphur and what is worse, up to 0.05 % arsenic, which may cause breaks in pig iron when cooled and which makes it worthless for further processes. Treatment is therefore costly. It is also a disadvantage that the ore should be so crumbly and sandy, which means that it must be made into briquettes or mixed. with better ores. In any case the ores must first be roasted. 135

Among the iron ore producing countries of the world, Ukraine comes fifth, along with France (4 mrd. t), USA (83.9 mrd. t), England (6.2 mrd. t), Russia (6—6.5 mrd. t). The iron ores of Kryvyj Rih are excellent in quality, but those of Kerch inferior. If they could be properly utilised, the position of Ukraine would be greatly strengthened, and the solution of the problem of iron quartzite would make it one of the first iron ore countries in the world.

6. Manganese Ores, Tin, Zinc etc.

There are small deposits of manganese ore in Ukraine at the following places: Labynska, the basin of the Bila and the Laba, at Khoshchevatka, district Haysyn in Podolia and in the southeast corner of the Galician Carpathians at the sources of the White and Black Cheremosh, where they were discovered a few years ago in inaccessible mountainous land. But Ukraine's eminent position as a country of manganese ore is due to Nikopil.

Nikopil, which has the richest deposit of manganese ore in the world, lies quite near the right bank of the Dnipro, about 230 km (200 km as crow flies) from the mouth of the river. It covers an area of about 150 sq. km. and comprises two sections, the western having richer deposits of better quality and being less worked than the eastern. Surveying by Prof. Vasylenko and others in the years 1928—1932 brought a great change in the exploitation of Nikopil manganese ore. Estimates of deposits were increased fourfold from about 100 million t. (see Table 7).

Compared with Chiaturi, the famous Georgian deposit of manganese ore in the Caucasus, Nikopil contains much more

Table 7. Most Important Deposits of Manganese Ore in World.

Area of occurrence.	Deposits in Mill. Total	Prospected		Chemical Analysis in % Mn	Fe_2O_3	Ph	SiO_2	H_2O
			Nikopil:					
Nikopil	399	90	for export	1. 48—50	1,5—2	0,19	10—12	10—12
Labynska	38	34		2. 42—43	2 —2,5	0,20	15—16	13—15
Carpathian	10	—	for domestic use	1. 46—48	—	0,20	11	12
Khoshchevatka	8	3		2. 40—42	—	0,20	16	15
Ukraine	455	127		—	—	—	—	—
				1. 52	—	0,16	8—9	6—8
Chiaturi (Georgia)	166	163	Washore	2. 51	—	—	9	—
				3. 50	—	—	10	—
Soviet Union	656	330	crude ore	1. 48	1,5—2	0,18	12	8—10
				2. 45	—	—	15	10—12
% Share of Ukraine	70	40		1. 50—52	3—6	0,11	5—8	0,4—1,2
India	—	100	India	2. 47—48	5—6	0,15	8—10	—
			Shandur	38—42	13—17	0,04	2—3	1—3
Brazil	180	34		48—50	3,5—4,5	0,125	4—5	8—10
				1. 48—52	5—6	0,14	5—7	3
Gold Coast	39	13		2. 44—47	7—10	0,175	5—7	—
				1. 48—50	5—9	0,037	2—4	—
South Africa	—	48		2. 45—48	11—14	0,037	2—4	—
Egypt	—	12		34—37	20—25	0,11	3—4	2—4
Marocco-Algiers	33	2		—	—	—	—	—

ore (399 as against 166 million t), so its total manganese content is higher (143—190) compared with 72 million t, in spite of smaller pure metal content in some mines (35—50 % compared with 47—53 %). But Chiaturi has a considerably higher proportion of ore that can be got at than Nikopil, where ¾ of the entire deposits come under Category C, "possible ores". So that the Georgian deposit comes first as a result of this fact and of its better quality and the more favorable mining conditions. Conditions of production are less favorable in Nikopil than in the Georgian ore-fields. It is true that the ore does not lie so deep in the earth, the top layer being only 6.5—25 meters thick. But its softness (clay, and also sand) means that mines have got to be built out with wood which must be brought from a distance. The thickness of the layers varies from 1.5 to 4 meters (in Chiatury 2—5 meters). The quality of the manganese ores at Nikopil is inferior to that of the deposits in Georgia and India. The deposits contain 90 % pyrolusit, which is the commonest manganese ore, but its consistency is often too fine, and lump ore is reckoned more valuable. The phosphor content is rather higher than in the two other deposits. On the whole, Nikopil ore is of a quality equal to that in other countries. 135

As a manganese ore country, Ukraine is first in the world with a quantity of more than 450 million t. Its manganese deposits are about 70 % of those in USSR and about 40 % of the total world resources.

Ukraine does indeed possess an abundant choice of other non-precious metals, but not in any great quantity. The mercury at Mykytivka in the Donets Basin is the only deposit in Ukraine that can be utilised for industry, and till recently, the only one in the USSR. In 1926 deposits were estimated at more than 6 000 t down to a depth of 320 m, an estimate that has recently been doubled. Naholnyj Krjaz where such metals are also found, though in small quantities, is in the Donets Basin, too. Deposits of copper ore are insignificant, while the zinc and lead ores at Sadon and Karachaj on the upper reaches of the Kuban are of importance. They are estimated at more than 3 million t. This figure also contains some silver. The reports of the discovery of rich deposits of nickel on the limans of

● 135 the Dnister in 1936 have not been seriously confirmed. Northern Caucasia has numerous deposits of non-precious metals, but little surveying has been done. According to what is known now, they do not, as a rule, contain any large quantities, but they might possibly play a certain rôle in the future.

7. Salt and Phosphorites

Cooking salt deposits occur every where in Ukraine, all three varieties of occurrence and of exploitation being present. It is difficult to estimate the total amount; in any case, Ukraine is one of the countries most rich in salt, even if it comes after the USA and Germany.

There is a rich deposit of rock salt in the north-west area of the Donets Basin, near Artemivske (formerly Bakhmut) and Slovianske in a wide hollow, distributed over an area of more than 1 500 sq. km. The thickness of the various strata of salt amounts to 30—40 m, the salt is extraordinarily pure (98 % NaCl), and uniform in composition. Recent estimates put the deposits at 100—120 mrd. t.

The rock salt deposit at Solotvyna, on the Tysa in Carpatho-Ukraine cannot be compared with the enormous deposits at Bakhmut. It is, however, quite extensive — 2.2 km long, 1.7 km broad, the depth being unknown, but at any rate more than 300 m. The salt layers are 8—30 m thick, and the percentage of impurities is low (2—4 %). Rock salt is also found on the Galician northern slopes of the Carpathians, very probably in great quantities, e. g. at Stebnyk, between the Dnister and Stryj; but these deposits have neither been prospected nor exploited.

Table-salt is got near Slovianske, from lakes, wells, and boreholes. In Galicia there are about 180 deposits from Latske near Peremyshl to the Bucovina, divided into six geographical groups. Numerous deposits also occur on the south slopes of the Carpathians.

Brine salt is got in the Crimea from about 300 salt lakes. Another 500 lie on the north-west coast of the Black Sea, round Kinburn. 7 limans between the Dnister and the Boh furnish salt, as did also the salt lakes in the Taman peninsula in the Kuban area.

3: Mirchuk S-4 (no date) 1949 RDI UKraine RDI

The salt lakes at Henycheske on the Sea of Oziv and those at 135
Batalpashynske in the Kuban area contain glauber salt.

There are fair quantities of potash salts in Galicia, on a strip 250 km long, stretching from Dobromyl (south of Peremyshl) parallel to the Carpathians to Kosiv. The richest deposits are at Kalish and Stebnyk, over an area of 250 sq. km. The salt strata are usually 4—18 m or 8—10 m thick.

Estimates of deposits vary between 100 million t with a pure content (K_2O) of 10—12 mill. t and 250 mill. t with 20 mill. t pure content. Even disregarding higher estimates (up to 450 mill. t.) this would represent 0.03—0.06 % of world store, of which Germany owns 55 %. The potash compounds in Galicia are sylvinite (18—35.5 % pure potash), kaynite (21.7 % K_2O) and glauconite (7—8 % K_2O) which appear distributed over a large area in Dnipro-Ukraine, at Kamjanets and in the north-east.

There are three or four deposits of phosphorites viz. on the Dnister and its left-bank tributaries in Galicia and in eastern Podolia, in the district of Chernyhiv and on the north-west edge of the Donets Basin, particularly round Izjum. In Galicia most of the phosphorites lie on a strip on the right bank of the Dnister, stretching for 65 km from Dovhe to the Zbruch; deposits are estimated at 33 mill. t. In (Eastern) Podolia they cover a large area (about 5000 sq. km), particularly on the Ushytsia, a northern tributary, and on the Dnister itself. They extend into the Ukrainian districts of Bessarabia. In 1923 deposits were estimated at 16.4 million t., the pure content amounts to an average of 35.5—36 %, and the excellent quality has long been known.

The deposit at Krolevets, on the right bank of the Desna in the area of Chernyhiv contains 1 million t. phosphorites with a pure content of 20—30 %, mining conditions being more favorable. The deposits in the Donets Basin are more extensive and amount to 30 mill. t., but their low percentage of pure content (17—22 %) detracted much from their value. It is

3; Mirchuk S-4 (no date) 1949 RD1 Ukraine RD1

135 only the technical discoveries of recent years that have restored value to inferior phosphorites.

The entire deposits of phosphorites in Ukraine amount to 62 mill. t. Like the potash, they are used in the manufacture of artificial manure. For a country that has got to produce such great quantities of agricultural produce, these deposits are none too big.

8. Varieties of Earth and Rock

Few countries have as much and as varied alumina as Ukraine. The largest deposit of fire-proof alumina is at Chasovyj-Yar in the Donets Basin, which amounts to 90 mill. t. There are other important deposits at Vladimirivka, Olenivka, Hozdory, Pjatykhatka etc.

Kaolin is the most valuable of all alumina and it is to be found on an enormous strip stretching from the marshes of Volynia in the north-west almost parallel to the Dnipro on its right bank to the orefields at Kryvyj Rih, then crossing to the left bank till to about 60—70 km distance from the Sea of Oziv.

Kaolin is found at about 315 places. On an average it is not more than 10 meters deep. The thickness of the various strata varies from a few meters to 106 m. The deposits are estimated at 120 mill. t. which would correspond to 40—50 mill. t. of pure content. The quality of the different deposits varies very much, but is often high.

9. Other Mineral Wealth

Other minerals to be found include ochre in large quantities and of excellent quality at several places, above all at Kryvyj Rih. Considerable deposits of gypsum, specially in the Bakhmut Hollow and in Podolia, limestone of all kinds from the highest quality to the commonest, is found almost all over Ukraine. Dolomites of excellent qualities are concentrated in the Donets area, marl for Portland cement etc. occurs in the Donets Basin, in Podolia and the Kyiv district and in inexhaustible quantities in the northern hollow, above all at Kupjanske and Artemivske.

3: Mirchuk S-4 (no date) 1949 RDl Ukraine RDl

Different varieties of granite are to be found on the Ukraine crystal plateau and also in Carpatho-Ukraine, as are also eruptive rocks in general. We mention labrodit, the largest deposit of its kind in Europe between Korosten and Zhytomir in Volynia, Volynian basalt, andesit in Carpatho-Ukraine, and also feldspat, mica-schist, and quartz, sand for the production of glass etc. 135 ●

Graphite of good quality occurs in considerable quantities in Podolia on the Boh, there being more important deposits at Kryvyj Rih; and in the district of Mariupil and Berdjanske.

They have not been thoroughly prospected. Deposits have been estimated at approximately 100 mill. t. and mostly consist of slaty kinds of crystal graphite such as are used in metallurgy (fireproof pots etc). The percentage of pure graphite varies between 17 and 25 % (in the better deposits even 60—70 %). In this and in other respects the graphite of Ukraine is like that of Passau and is, in quality, inferior only to few (perhaps to that of Ceylon and Madagascar).

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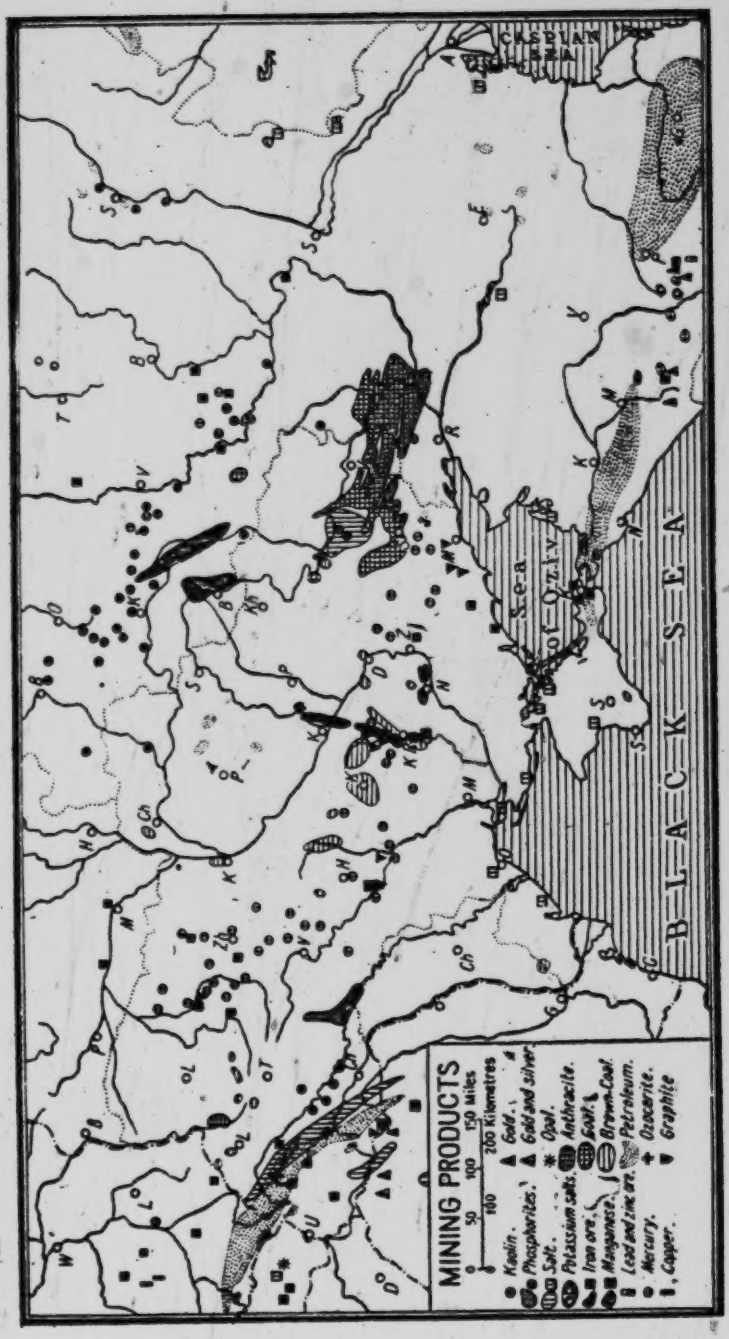

Table 10. Nikopil in World

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	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899
Nikopil	9	11	29	73	58	51	46	48	60	97
Chiaturi	140	102	170	70	97	170	160	320	280	549
Russian Empire	162	114	200	143	157	222	208	370	342	648
Nikopil %	5,5	9,5	14,5	50	38,5	23	22	13	17,5	15
India	—	—	—	—	12	16	58	75	61	89
Brazil	—	—	—	—	2	5	14	16	26	65
World Production	375	260	375	310	385	395	490	630	590	990
Nikopil %	2.5	4	8	23	15	12,5	9,5	7,5	8	10
Nikopil's place in world production	—	—	4.	1.	2.	2.	3.	3.	3.	2.

	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923
Nikopil	239	276	227	187	100	9	0,5	6	42	111
Chiaturi	663	258	258	204	26	55	121	—	53	194
Soviet Union	907	537	472	393	126	66	125	12	103	313
Nikopil %	26,5	51,5	48	47,5	79,5	14,5	0,5	50	40	35,5
India	694	418	665	600	526	547	748	690	482	706
Brazil	184	289	503	533	393	206	354	276	341	236
Gold Coast	—	—	4	32	31	36	44	7	67	142
Egypt	—	—	—	—	—	49	78	55	104	132
World Production	1870	1410	1860	2080	1750	1160	1160	1180	1220	1750
Nikopil %	13	19,5	12	9	5,5	1	—	0,5	3,5	7,5
Nikopil's place in world production	3.	3.	4.	4.	4.	—	—	—	6.	6.

327 practically all excellent coal); nevertheless, they amply suffice for the industrial needs of Ukraine.

● 135 316 Ore resources, on the other hand, are considerably richer in Ukraine. The first-class deposits at Kryvyj Rih alone are only a little less than the equally excellent deposits in the Ural (1.2 milliard t, compared with 1.4 milliard t), but as the percentage prospected is low (30 compared with 52 %), it has reserves for the future in its thick seams of iron quartzite. The iron content of the Kryvyj Rih ore being higher, it has greater resources of pure iron metal (540 million t) than the Ural (411 million t). To this we must add the iron-ore deposits at Kerch (2.7 milliard t). The manganese resources of the Donets Combine are the largest in the world (400 million t.).

3: Mirchuk S-4 (no date) 1949 RDl Ukraine RDl

Production of Manganese Ore.

1900	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913
90	66	57	34	59	149	162	272	180	151	178	202	239	276
661	370	415	377	332	342	826	678	117	612	554	469	578	966
755	443	479	414	396	498	994	956	302	765	733	674	820	1245
12	15	12	8,5	15	30	16,5	28,5	59,5	20	24,5	30	29	22
130	123	160	174	153	251	579	917	685	655	814	681	643	828
108	100	157	162	208	224	121	237	166	241	254	174	155	122
1330	970	1060	940	920	1140	1920	2360	1290	1690	1900	1640	1740	2350
6,5	6,5	5,5	3,5	6,5	13	8,5	11,5	14	9	9,5	12,5	13,5	11,5
4.	4.	4.	4.	4.	4.	3.	3.	2.	4.	4.	3.	3.	3.

1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937
113	241	478	472	531	580	602	493	443	524	818	1037	(1270)	960
339	544	543	372	172	830	783	390	389	481	914	1180	1502	1650
459	787	1029	844	702	1410	1385	883	832	1021	1822	2385	3000	2750
24,5	30,5	46,5	56	75,5	41	43,5	56	53	51	45	43,5	(42,5)	35
816	853	1032	1147	994	1010	843	546	216	222	413	652	827	—
159	332	261	273	360	316	207	147	37	20	7	42	156	265
259	344	350	375	330	415	424	251	51	269	371	438	417	535
150	81	122	153	137	191	121	102	0,3	1	1	87	—	14
140	2770	3130	3180	2960	3770	3530	2320	1290	1740	2970	4010	4920	—
5,5	8,5	15,5	15	18	15.5	17	21	34	30	27,5	26	(26)	—
6.	5.	3.	2.	2.	3.	3.	2.	1.	1.	2.	2.	2.	—

Deposits in the Ural only come second or third, even if they suffice for the needs of the Kusnetsk at the moment. The Donets Basin is particularly well supplied with subsidiary materials for heavy industry (limestone, dolomites, fire-proof alumina and graphite), there being deposits of the kinds required at Kryvyj Rih, Mariupil and Berdjanske. The distance between ore and coal is not too great to be unprofitable, viz. 350—450 km to the Donets coal from the iron ore at Kryvyj Rih, 250—350 km from the manganese ores at Nikopil and 50—100 km between the two ore-fields. It is true that in England distances are more favorable, but they are no better than in Sweden, Germany, or France. Compared with the distance between the Ural ores and the Kusnets coal (2000 km) conditions of propinquity are first-rate in Ukraine.

4: Allen H-4 (no date) 1941 RD1 Ukraine RD1

Caucasus were not inferior to those of New Russia and climatic conditions were much more favourable: rainfall, owing to the proximity of the great Caucasian ranges, was more regular. The Kuban region did actually become a granary. Rostov-on-the-Don grew and flourished in true 'American style'. A new grain port, Novorossiysk, was built and soon became a rival to Odessa.

Further railway development accompanied the exploitation of the Donets coal-mines and the growth of a metallurgical industry centred on the Krivoy Rog iron-ore deposits located to the west of the Dniepr. Two parallel lines were constructed to pass through Ekaterinoslav and the old district of the Zaporogian *Sech*, connecting the Donets basin with Krivoy Rog. Thus, simultaneously with the industrial development in the south and the flowering of the North Caucasian region, a new 'granary' and new regions of great mineral potential began at the turn of the century to impose a 'latitudinal' direction on railway construction: the opening of the great Siberian railway gave almost a priority to the possibilities of agricultural production in western and southern Siberia, and connected Chelyabinsk, through Ekaterinenburg, Vyatka and Vologda, with the Baltic ports. At the same time 'diagonal' development was proceeding far to the south-east through Turkestan to the frontiers of Afghanistan and the Chinese Empire.

The importance of the natural riches of Asiatic Russia came to be realized with an ever-growing force during the reign of Nicholas II (1896–1917). The principal economic axis of the Empire was evidently changing direction from the 'meridial' to the 'latitudinal'. The political policy of the Empire during the same period, with its emphasis on the Balkan Slavs and on the 'Byzantine' dreams of the epoch of Catherine II, was certainly archaistic in tendency and bore no relation to the fundamental realities of Eurasian geography.

The War of 1914–18 brought down in destruction that peculiarly hybrid cultural synthesis which was Romanov Russia; it obliterated at the same time the neo-Byzantine plans of the Pan-Slavists and weakened the whole position of Russia as a European power. The loss of a wide belt of territories (the whole inheritance of two hundred years of Romanov autocracy) between the Arctic and the Black Sea imposed on the new Soviet state the sheer necessity of a 'latitudinal' rather than a 'meridial' development. During the last two decades new efforts have been made to open up the agricultural and mineral wealth of the steppes beyond the Volga and the Ural in western and southern Siberia and of the valleys of the Altai and the Tien-Shan; and, while historic Russian ambitions in the Balkans

4: Allen H-4 (no date) 1941 RD1 Ukraine RD1

433 ness and ideological fanaticism which are so characteristic of Com-
185 munist psychology—itself a manifestation of a certain state of spiritual sterility—were brought to bear to achieve ultimate objects, which on the American continent during the preceding century had been attained by more balanced, hardly less heroic, and certainly less catastrophic methods.

§ 3. INDUSTRIAL HISTORY OF THE UKRAINE

135 The industrial development of the Ukraine has been based on the
131 exploitation of the coal deposits of the Donets basin and of the iron-ore and manganese fields situated west of the Dniepr. Abundant layers of coal are found along both banks of the Donets. The eastern part of the carboniferous region lies within the territory of the Don with its Cossack population. The western part, which constitutes about two-thirds of the whole region, is situated within the boundaries of Soviet Ukraine.

Whether the Donets region properly belongs to the Ukraine is a question which has never been definitely settled. Historically, the lands along the right bank of the river Donets in its northern part belonged to that 'New Ukraine' which began to be populated in the second half of the seventeenth century by settlers from Muscovy and by fugitives from Hetman's Ukraine—at that time devastated by the Turkish invasions of Ahmed Köprülü and Kara Mustafa. Subsequently, these lands were incorporated in the Government of Kharkov. The lands along the southern course of the Donets formed part of the extreme eastern angle of New Russia where settled life only really began in the eighteenth century after the Tartar Nogay Horde, which roamed over this region, had retired beyond the Volga.

In 1917 the Provisional Government, in admitting five Ukrainian Governments as the legitimate area for the exercise of 'the national and cultural influence of the Kiev *Rada*', excluded the Government of Kharkov for the reason that the Donets coal area lay within it. The Ukrainian language is not commonly spoken in the coal-fields, and even if the large numbers of temporary labourers who come in from the north are ignored, not more than half the population of Donbass (the Donets coal area) can boast of their Ukrainian origin. In general, this region has nothing which unites its mixed industrial population to the essentially Ukrainian rural population of adjoining regions to the west. The only real link which connects the Donets coal-fields with the industrial districts along the Dniepr and the manganese and iron-ore regions is a purely economic one.

4: Allen H-4 (no date) 1941 RD1 Ukraine RD1

According to both German and Soviet geological calculations, the reserves of coal in the Donets area amount to about 55 milliard tons. The deposits are largely anthracite—inferior in quality to Welsh.

Donets coal was the basis of the early industrial development of the South of Russia. Exploitation was begun in the middle of the nineteenth century; the construction of railway lines speeded up development during the seventies, and in the eighties Donets coal was already in use in the industries of the Moscow and Petersburg regions. After the discovery, about 1890, of abundant iron-ore deposits to the west of the lower Dniepr, the Donets coal industry acquired a rapidly growing importance. Between 1900 and 1913 output was increased at the rate of 17 per cent per annum. In 1913 the Ukrainian part of the coal-field delivered 23 million tons: in 1916, 29 million. During this period the Donets fields supplied all the southern industries with coal, and its contribution to northern industries became important with the construction of a new line direct from the mine area to Moscow. More than half the coal industry, before the Revolution, was financed by French capital.

For some time after the Revolution the output of the mines was relatively insignificant: during 1919 the area was the scene of desperate battles between 'Whites' and 'Reds', and later it was devastated by the raids of Makhno and other anarchic *atamany*. The famine of 1921–2 accentuated the terrible conditions. During the period of the New Economic Policy, output of coal gradually revived, and in 1929 fell little short of that of 1913. The First Five Year Plan prescribed the accelerated industrialization of the Ukrainian mineral-bearing areas. The social struggle which formed part of the 'Revolution against Peasantry' did not particularly affect the Donets, but the famine of 1932–3 had its influence there. Nevertheless, if Soviet statistics are to be credited, the Government succeeded in coping with the difficulties, and in 1934 a production of 68 million tons of coal and anthracite was claimed—representing an output in excess of that of France. Ukrainian production occupied fourth place—after U.S., Great Britain and Germany. For 1938, Soviet statistics gave a production of 74 million tons out of a total of 104½ million tons for the whole of the Soviet Union. The average annual increase in production for the last five years, 1934–9, is substantially less than that for the preceding five years, 1929–34. One of the reasons for this is stated to be the difficulty of retaining labour which was available during the period of social conflict in the countryside, but which has drifted back to the farms following improvement in the conditions in the *Kolkhozy*. Labour

4: Allen H-4 (no date) 1941 RDI Ukraine RDI

labour
464 is very fluid in Donbass; an annual turnover of 40–50 per cent is estimated.

Soviet official information concerning the iron-ore industry
● 135 of Krivoy Rog is probably more reliable than that concerning
316 Donbass. The reserves of iron ore of high quality (40 per cent iron) are reckoned at 1100 million tons; some Ukrainian economists put these in excess of 3000 million tons. Mining in the Krivoy Rog (south-west of Ekaterinoslav and south-east of Elizavetgrad) began in the nineties and attained considerable proportions by the beginning of the present century. For the years 1913–16 average output was about 5 million tons per annum. According to Soviet statistics, output for 1938 was round 18 million tons.

Conditions for the development of metallurgical industry are extraordinarily favourable in New Russia: on one side of the Dniepr coal, and on the other iron. This is not all: along the banks of the Dniepr itself, round Nikopol and Khvochevatka, to the south of the old ground of the Zaporogian *Sech*, are rich mines of manganese, the quality of which is little inferior to that of the Georgian deposits at Chiaturi. According to the estimates of Ukrainian economists, reserves on the Dniepr amount to about 400 million tons: even if these estimates are exaggerated, there can be no doubt that the deposit is one of the most valuable in the world.

The production of the Dniepr manganese mines has risen from 260,000 tons in 1916 to over 1,000,000 tons in 1938. If the U.S.S.R. is the principal world producer, the Ukraine alone ranks before British India and South Africa (from which two latter countries it is worth recalling that Germany imported 585,000 tons in 1937).

The deposits of coal in Donbass, of iron at Krivoy Rog and of manganese round Nikopol are connected by railway lines which function probably more efficiently than any others in U.S.S.R. The juxtaposition of the mineral deposits and the metallurgical plants ensures full loads both ways. Only 18 per cent of Donets coal is exported outside the Ukraine, and only 5 per cent of the iron ore; the balance is consumed by the South Russian industries. Manganese, on the other hand, is exported abroad in large quantities.

325 Important metallurgical plants (70 per cent of the capital of
103 which had been found by French and Belgian houses) existed in the South of Russia prior to the Revolution. In the 'Eastern' (Donets-Azov) group were included the following works: 'The New Russian' (station, Yuzovka, recalling the name of the Welshman Hughes); 'The Russo-Belgian' (Enakievo); 'The Kramatorsky' (Kramatorskaya); 'The Konstantinovsky' (Konstantinovskaya); 'The Donets-Yuriev' (Alchevskaya); 'The Nikopol-Mariupol'

4: Allen H-4 (no date) 1941 RD1 Ukraine RD1

U.S.S.R., and there is no doubt that one of the results will be a further weakening of Ukrainian elements where the Government considers them to be still too strong

Secondary Branches of Ukrainian Agriculture

In addition to wheat, *rye*, *barley*, *oat* and *maize* crops are important. *Millet* is also grown and forms the base of the broth (*psheno*) which is a favourite dish in the South of Russia (in the North this broth or porridge is made from buck-wheat).

Clover and *lucerne* are comparatively little cultivated, and almost exclusively in right-bank Ukraine and Galicia.

About a million hectares are under *potatoes* in right-bank Ukraine; the bulk of the crop goes to the alcohol distilleries.

Sunflower-seed is important in the production of oil; *hemp* and small quantities of *linseed* and *mustard-seed* are produced for the same purpose.

The cultivation of *hops* was always traditional in Volhynia; in pre-Revolutionary days half of the hop production of the Empire came from Volhynia and right-bank Ukraine. In late years production has greatly declined.

Tobacco, the cultivation of which was introduced by Greek immigrants in the eighteenth century, is a speciality of the districts of Nezhin and Romen. The quality is not good and the cultivation of tobacco has no future in the Ukraine.

Particularly in Podolia and the region of Uman, *kolkhozniki* take great interest in horticulture; about 200,000 hectares are under orchards. On many *Kolkhozy* the *kolkhozniki* occupy themselves on the private cultivation of *tomatoes*, and the Government has set up canning plants in order to encourage this branch of production.

The *vine* grows well on the banks of the Dniepr and the southern Bug, in the neighbourhood of Berdyansk and Odessa, and along the Dniestr. But wine production has not been developed on the scale which it has attained in Bessarabia and the Crimea.

The Soviet Government favours agricultural experiments, and some *Kolkhozy* in the South have tried to cultivate *rice*—so far with little success.

An experiment on a large scale was made in the cultivation of *cotton*. 190,000 hectares between the mouth of the Dniepr and Perekop were reserved, but it is not likely that cotton cultivation in the Ukraine will prove the success which it has in the more suitable climates of Azerbaijan and Turkestan.

Secondary Mineral Resources in the Ukraine

Reserves of different qualities of *lignite* are distributed over many parts of the Ukraine. In view of the abundance of other resources of calorific power, exploitation has not been greatly developed, but output of lignite in the region of Elizavetgrad attains 300,000 tons a year.

A million tons of *peat* is cut annually in Ukraine—about 10 per cent of the output of U.S.S.R.

Bauxites in the Dniepr region are utilized for the Aluminium Works near Dnieprostroy.

4: Allen H-4 (no date) 1941 RD1 Ukraine RD1

Mercury is mined near Nikitovka Junction in Donbass.

Graphite deposits in the vicinity of Uman have recently been prospected. /135 ●

There are important deposits of *salt* in north-east Donbass.

Search has been made for *copper*, *tin* and *petroleum*. Indications of petroleum deposits have been discovered in the region of Poltava and on the shores of the Azov Sea. In different places deposits of high quality *clay* (*kaolin*) are found.

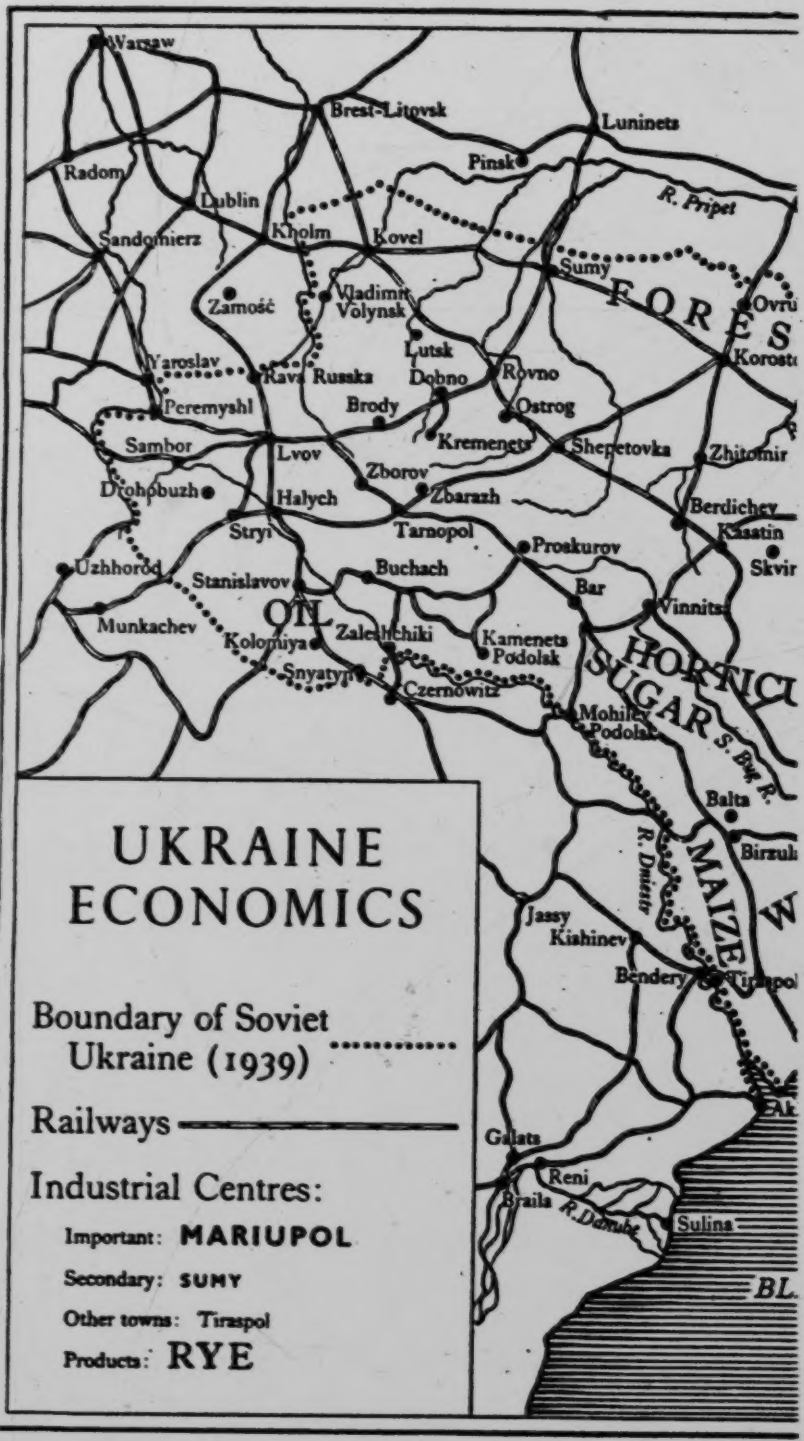
'The Mystery' of Soviet Production

A Russian mining engineer has contributed this note: 'It is quite impossible to ascertain where and how the enormous quantities of calorifics and metals which figure in Soviet statistics disappear, when one takes into consideration the absence of these products in the every-day life of the population. It is quite a usual occurrence that the simplest tools, common nails, sheet iron, are found to be unobtainable in U.S.S.R. Sometimes old roofs are torn off houses in order to cover new buildings.... Further, the greatest consumer of iron, railway construction, so active before the Revolution, is practically non-existent in these days. During the Five Year Plan only 5000 km. of railway lines were laid; and in general, under the Soviet régime, railway lines begun before and during the war have been left uncompleted. 000

'Soviet officials have never been able to give a satisfactory explanation of what happens to the metals produced in U.S.S.R. In conversations with foreigners they speak of "military needs", but these do not explain in full the destination of the vast alleged production, nor does the consumption in tractor and motor factories, nor the building which has been proceeding in expanding industrial towns like Lugansk, Zaporozhie and Kharkov. There has also been great construction work undertaken in the Moscow area, but no exact statistics for the consumption of metals in the building trades have been forthcoming which can adequately explain the use made of the vast output alleged to have been mined.'

Th. Makcheeff (*op. cit.*) thinks that in the Soviet statistics of output in heavy industry is included a large proportion of "shoddy" products. The 1913 figures excluded goods not up to standard; for the metallurgical factories were private concerns and not consumers as well: shoddy products were accordingly not taken into account. The Soviet Government being at once consumer and producer puts all its shoddy products into circulation, and these, according to the Soviet press, amount to 90 %, and are referred to as "Second Quality Products."

4: Allen H-4 (no date) 1941 RD1 Ukraine RD1



UKRAINE ECONOMICS

Boundary of Soviet Ukraine (1939) .....

Railways ———

Industrial Centres:

Important: **MARIUPOL**

Secondary: **SUMY**

Other towns: Tiraspol

Products: **RYE**

404 (a)

4: Allen H-4 (no date) 1941 RD1 Ukraine RD1

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404 (B)

4: Allen H-4 (no date) 1941 RD1 Ukraine RD1

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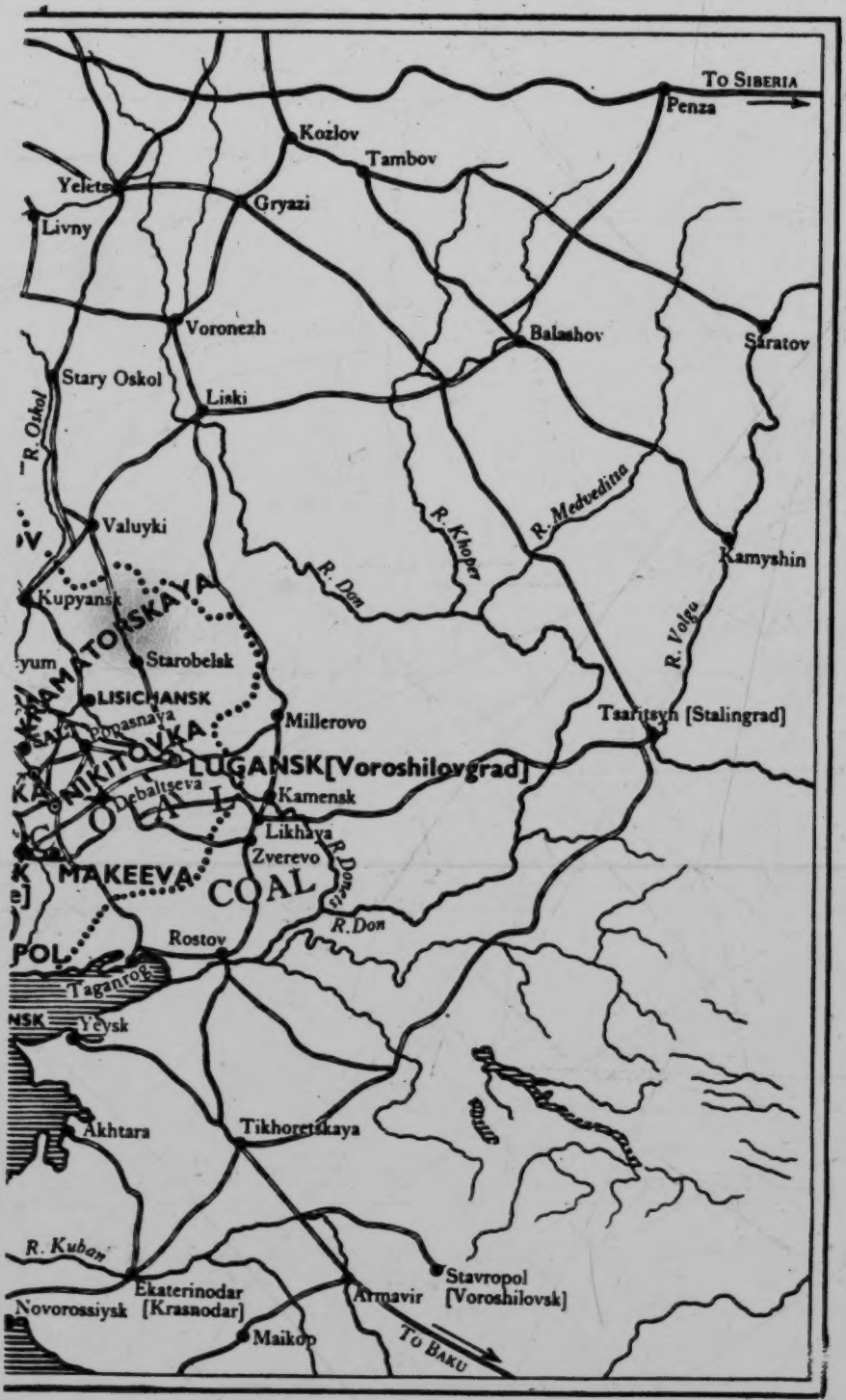

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7:Bregy & Obolensky H-4, 5 (no date) 1940 RD1 Ukraine RD1

(the northern or southern limits of certain cultivations and of different methods of agricultural exploitation), of cattle-breeding (the predominance of cattle and of pigs in Zone 1 and of horses and sheep in Zone 2), of industry (metallurgy and other heavy industries in Zone 2 and light industry in Zone 1), or of communications, this border corresponds with undoubted economic realities.

Chance, or rather its geological structure, has decreed that Zone 2 should possess all the mineral riches of the Ukraine while Zone 1 has none except, however, an insignificant deposit of oil in Polish Galicia, near Stanislavov.

I

Population

As we have previously said, the population of the Ukraine is about 43,000,000, of whom 33·5 millions live within the frontiers of the Soviet Ukraine in the 11,500 parishes, 95 hamlets, and 90 towns.

Among all the Russian lands the Ukraine, with the industrial region of Moscow, is one of those with the densest population, especially in the region of Kiev and of Vinnitza, where the density reaches about 100 inhabitants to the square kilometre.

The average density of 70·6 inhabitants per square kilometre for the whole territory is almost the same in both zones, though a little higher in Zone 1, being from 65 to 87 with an average of 76 inhabitants per square kilometre, while Zone 2 has only 43 to 76, with an average of 65.

The least populated districts are the provinces of the south-east, the districts of Melitopol, Mariupol, and Lougansk, all in Zone 2.

Despite the small differences in the density of the

[see category 116) pp. 139-140.---Analyst]

102
● 135
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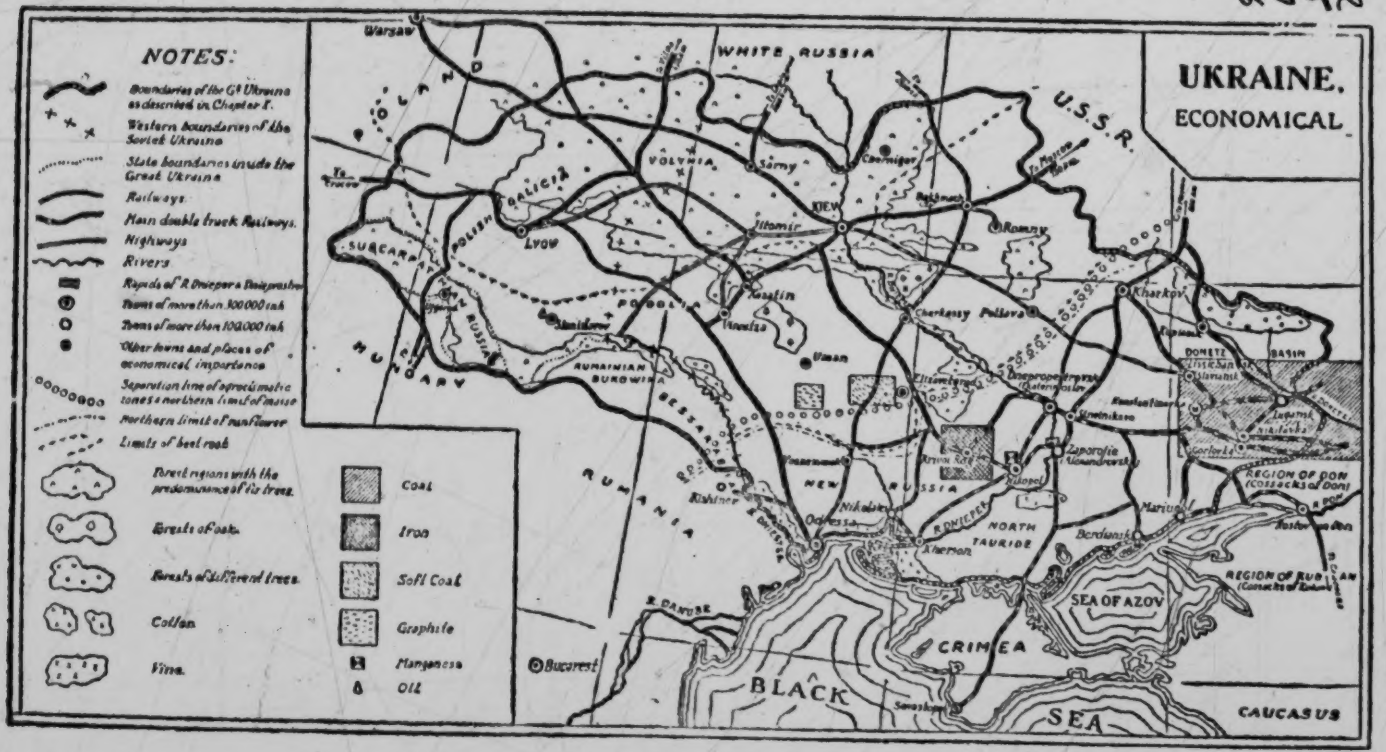
496



MAP No. 5

p 151

7:Bregy & Obolensky H-4, 5 (no date) 1940 RD1 Ukraine RD1

7:Bregy & Obolensky H-4, 5 (no date) 1940 RD1 Ukraine RD1

popular for sea bathing, although the beaches still lack a good tourist organization.

Nevertheless this branch of the activities of the country could, under more favourable circumstances, give a stable revenue to the population and thus contribute towards the enrichment of the Ukraine.

III

The Subsoil and Industry

Among the mineral riches of the Ukraine the first place belongs to coal and to iron ore.

These two important raw materials are to be found in Zone 2[1] coal in the Donietz basin and iron ore on the left bank of the Ingouletz (a tributary of the Boug) at Krivoi-Rog.

Besides these two fundamentally important resources the Ukraine possesses important deposits of manganese and aluminium in the surroundings of Nikopol, graphite and soft coal mines, recently discovered in the centre of the country, salt in the Donietz basin, and finally peat and oil wells in Polish Galicia, in the surroundings of Stanislavov. Geological researches recently carried out have led to the discovery of oil on the shores of the Sea of Azov.

In order to give an idea of the potential reserves awaiting exploitation in the subsoil of the Ukraine, let us indicate that before the last war production represented 135 gold francs per annum per inhabitant.

As a result of its naturally very rich geological structure and of the organization of the extraction of its resources, the basin of the Donietz could be compared with the best coal-producing centres of Europe. Its reserves may be less important than those of Siberia (Kouznetsk),

[1] [See category 116, pp. 139-140 --- Analyst]

8: Fedenko H-4, 5 (no date) 1951 RD1 Ukraine RD1
Soviet Union R1

INTRODUCTION

The author of this book is a historian. He has taken part in the Ukrainian national revolution from 1917 on. The book has been written to fix facts that are very often forgotten in the world, or are given a false interpretation in the various books on the Eastern European problem.

The principal fact from which the whole fatal conflict between Ukraine and Soviet Russia arises is that Ukraine has a democratic tradition created by the preceding historical evolution. Modern Russia is a continuation of the Muscovite Tsardom that has grown on the foundations of eastern despotism. For this reason Russia has not created a democratic tradition of its own up to this day and has a "considerable lack of European tradition", as it has been stated by the well known Russian historian Klyuchevsky. Therefore Communist dictatorship so easily seized power in Russia after the revolution of 1917, while the other peoples of the former Tsarist Empire, Ukrainians, Finns, Estonians, Latvians, Lithuanians, Georgians, etc., created democratic states of their own.

The tragedy of the unhappy neighbours of Russia is that Russian imperialism in the past and present times has been principally directed against them, has enslaved and even exstirpated them.

The Ukrainian nation occupies a particular place in Eastern Europe both by its number, circa 35 millions, and by its geographical position, and especially by its large natural resources*). The famous British political writer Professor R. W. Seton-Watson states that the Ukrainian problem has been one of the reasons for World War I 1914—1918. It is generally known that the conquest of Ukraine was the principal aim for Hitler's 'Pressure to the East'. Thus World War II had the struggle for Ukraine as one of its reasons too.

We are living in a time when imperialism is being condemned as one of the greatest evils to mankind, but we see at the same time

*) The most important natural riches of Ukraine are: coal (Donets Bassin), iron ore (Krivoy Rog), oil (Boryslaw), manganese (Nikopol). The export of grain from Ukraine to Western Europe until 1914 was higher than 5,5 mil. tons per year. The production of sugar and spirit was very important. The export of agricultural products from Tsarist Russia came in its great part from Ukraine.

9: Prothero G-4 (no date) 1920 RD1 Ukraine RD1

either by salting, smoking, or sun-curing. Fish-curing is carried on in factories at Odessa and Ochakov.

The fisheries in the Azov Sea are important, but the principal grounds are not in Ukrainian territory, those which lie within its limits being of insignificant value.

(4) Minerals

(*a*) *Natural Resources*

The principal mineral resources of the Ukraine are coal, iron, and salt.

The *coal* is all in one large field usually known as the Donets basin, which extends from west to east for a distance of 300 miles. It is considered the largest coalfield in Europe, but owing to peculiarities of the geological strata it is split up into several areas with varying qualities of coal. Roughly the flame coals are on the western end of the field, the coking and semi-anthracite coals in the centre, and the anthracite in the east, though coking coals are also found towards the north-east corner. Very little pure anthracite is mined on Ukraine territory, as the beds are mainly in the Don Cossack district. Throughout the field the seams vary much in thickness. Some are too thin to be worked. The average thickness of those worked is 21 to 35 in.; seams of 5 ft. are moderately common, and the maximum thickness is 7 ft.

The output of coal from the Donets field is variable. This is chiefly due to labour difficulties, which arise in unexpected ways. Nevertheless if the figures of several years are considered together, a great increase is shown, and new pits are being opened every year. The average production for the years 1908 to 1912 was over 14,000,000 tons, the proportion of bituminous coal to anthracite being as 8 to 1. The figures include the whole field, as separate statistics for the portion over the Don Cossack border are not issued.

Iron.—The Ukraine is fortunate in having in close proximity to its coalfield a district rich in iron ore. The deposit, which is of excellent quality and easily worked,

642 On one-sixth of the world all the treasures within the earth and all that grows on top of it belong to the workers, as well as all mines, factories, and means of communication. The workers distribute the goods, they make the laws, determine the working hours, wages and prices; they also establish the deductions from wages and salaries and make out the taxes. Everyone must work, there are no persons of independent means and no capitalistic employers who can fatten on profits. The workers are the sovereign lords in the Soviet Union, and nothing prevents them from enjoying the enormous wealth of their country. Stalin had this theory in mind when he stated in his introduction to the new constitution in November 1936: "... in the field of political economy of the Soviet Union we now have a new socialistic economy which knows no depressions and no unemployment, no misery and no profit, and which grants its citizens every possibility for a life of comfort and civilization."

According to this definition, life in the Ukraine should be the most attractive; here is the country richest in natural resources in eastern Europe, with a pleasant, sunny climate. The raw
• 85 materials are happily balanced and are found within favorable distances between each other. There is coal, iron ore, manganese ore, water power, oil, turf, salt, potassium salts, phosphate and kaolin. There is lacking, with the exception of a certain amount of mercury and nickle, only colored metals.

361 /160/ The exploitation of Ukrainian natural resources is comparatively recent. The Englishman Hughes John established industry in the 1870s in the Donets region, and shortly thereafter Frenchmen and Belgians founded the ore industry near Krivoy Rog. The present-day industrial cities developed from the barracks of the first workers'
000 settlements. The tremendous increase in popula-

316 million tons. The beds in the Donets Basin have the advantage of being shallow and the disadvantage of being unevenly distributed and not very large. They are only three-quarters of a meter in diameter. Besides, the coal is impure and also has a high ash content. In spite of the fact that more is produced, the method of mining is antiquated.

Besides the incidence of brown coal in the Donets region, there are 120 smaller deposits in the right-bank region of the Ukraine, but they /162/ are scarcely exploited. It is presumed that there are larger deposits in this region also. In 1935 the total reserves of brown coal in the Soviet Ukraine were estimated at 550 million tons. (100) The mining of this coal is very much neg-

100. Kubiyovich: Geography of the Ukrainian and Bordering Areas, page 442.

lected and ore-dressing is unknown. In 1935 a total of 300,000 tons of brown coal was extracted in all the Ukrainian provinces, 240,000 tons of which came from eastern Ukraine. (101) The ex-

101. Deminskiy: The Economy of the Ukraine, page 137.

tensive peat bogs are merely of local importance.

315 When it comes to oil, the Ukrainian earth is
● 135 not niggardly. Well-known as the oil fields of Drogobich and Borislav on the northern slope of the Carpathians, the reserves of which are estimated at 58 to 100 million tons. Extraction reached its height as early as 1902 when it amounted to 2 million tons or 5% of world production. Since then it has constantly decreased, amounting to 1.1 million tons in 1913 and an annual average of 500,000 to 600,000 tons from 1932 to 1936. (102)

102. Kubiyovich: Geography of the Ukrainian and Bordering Areas, page 443.

135 The third oil region lies close by the Ukrainian border, many hundreds of kilometers distant from the compact Russian area of settlement, not far from the Caspis on the Terek. These reserves are estimated at 900 million tons. In 1925 2 million tons were extracted, in 1932 over 8 million tons, and in 1933 somewhat more than 5 million tons. (103) From the occurrence of inflammable and

103. Kubiyovich: Atlas...,page 53.

earth gases, oil reserves are suspected to be present on the northern coast of the Sea of Azov and along the Dniestr. The salts in the Donets Basin and along the Carpathians, and the sea salt near Odessa round off the wealth of natural resources. Potassium salts are deposited in Galicia, potassium gluconites in East Podolia, at the Dnepr and near Isyum; phosphates in Podolia along the Dnestr and in northern Ukraine near Chernigov; excellent kaolins are found in the region between Volhynia and the Black Sea, and graphite near
312 Krivoy Rog. The entire water-power reserves of the Ukrainian provinces are estimated at 9 million horse power; of this only one-tenth was utilized in 1932. /163/

329 Two industrial regions are connected with local natural resources. These are, first, the Donets Basin, rich in coal and salt, with coal mines, coke plants, foundaries and steel works. Here ore from Kerch and Krivoy Rog is smelted. Secondly, there is the mining district of Krivoy Rog and Mykopil on the Dnepr with iron and manganese mines, smelting factories, foundaries and metallurgic factories. With the completion of the large Dnepr power plant at Zaporishea - the normal water level was raised 37.5 meters by the construction of a mighty cofferdam and sluice along the entire rapids, which made the river navigable throughout - the industrial region of Krivoy

I INTRODUCTION

101 The Ukrainian Soviet Socialist Republic (the Ukraine) is one of the U.S.S.R.'s sixteen constituent Union Republics. Situated in the south-western corner of the Soviet Union, the Ukraine is bordered on the south by the Black and Azov Seas and the Crimea (part of Russia); its western border touches the frontiers of Rumania, Hungary, Czechoslovakia, and Poland as well as the Moldavian Soviet Socialist Republic. Towards the north the Ukrainian S.S.R. verges on two other Soviet Republics: Byelorussia and Russia; and it is the Russian neighbourhood of the Don river which forms the Ukraine's eastern border.

101 In economic development and in population the Ukraine is second 135 greatest of the Soviet Republics. It has a fertile soil, a mild humid climate, and is rich in deposits of coal, oil, iron, manganese and salts, as well as in building materials. It has four main rivers: the Dnieper (third largest in Europe), the Dniester, the Bug, and the Donets (a tributary of the Don), which are navigable and are also useful reservoirs of power.

433 Before 1941 the Ukraine contained more than one-fifth of the in- 162 habitants of the entire Soviet Union. Its industry produced 54 per cent. of the coal, 60 per cent. of the pig iron, 48 per cent. of the steel, and 35 per cent. of the manganese ore turned out in the whole U.S.S.R.; it manufactured railway engines and cars, tractors, turbines, harvester combines, and mining and agricultural machinery for all parts of the Soviet Union. "It also produced artificial fertilizers, soda, glass and cement. The output of the sugar, meat-packing, flour-milling, distilling, and dairy industries reached great dimensions. Fishing was developed in the Black Sea and Azov Sea. The Dnieper Power Station, 361 the largest in Europe, was famous throughout the world. The cities of the Ukraine, both old and new, developed rapidly; during the past 25 years 77 new cities and 285 industrial settlements were built."[1]

241 Agriculture also was highly developed. In 1937-38 Ukrainian farms accounted for nearly one-fifth of the grain, one-sixth of the potatoes, and two-thirds of the sugar beet produced in the Soviet Union. The Ukraine also had a large proportion of the total Soviet Union livestock. Millions of head of cattle, pigs, sheep, and poultry were raised. Ukrainian agriculture was highly mechanized; before the war there were 90,000 tractors and 31,000 harvesting combines operating in the fields.

Area and Population

131 In January 1939 the Ukrainian Republic had an area of about 469,700 square kilometres including 8,000 square kilometres in its

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1 The Sixteen Soviet Republics, Soviet News, London, 1945.

III INDUSTRY AND TRANSPORT

135 311 433 Ukrainian industry is based chiefly on rich deposits of coal in the Donets Basin, iron ore in the Krivoi Rog district (where the ore contains 60 per cent. metal), and manganese ore in the Nikopol area. To utilize this great natural wealth a very large metallurgical and machine-building industry has been built up in the Ukraine. At the same time, many food factories including sugar refineries, have been created to process the food so abundantly produced by Ukrainian farms. In the period between wars, the share of the Ukraine in the country's industrial output declined somewhat, not because of slackened activity - on the contrary, Ukrainian industry continued to be even more intensively developed - but because the policy of the U.S.S.R. was to decentralize, and to expand and develop those areas, particularly the eastern ones which previously had no industry. This lengthening of the industrial pace naturally brought about a certain change in emphasis, so that whereas by 1938 the productivity of Soviet industry as a whole had increased to about eight times the output of Tsarist Russia in 1913; the proportion of Ukrainian output in the total was lessened. For example, in 1928 the Krivoi Rog district of the Ukraine produced 78 per cent. of all the iron ore in the U.S.S.R.; but in 1937, although this district was producing more, its share in the total was only 47 per cent.

War Damage to Industry

727 433 Before they were finally driven from the Ukraine the Germans furiously set about wrecking those Ukrainian industries which still survived. They stripped the plants of equipment and destroyed the buildings; they flooded the coal mines; they completed the destruction of the famous Lenin Hydro-Electric Power Station and the Dnieper Dam - both of which had been partially disabled by the retreating Soviet Army troops on August 28, 1941.

The damage to all branches of industry was tremendous and will take many years to repair, particularly since the shortages of labour and equipment, as well as the scarcity of food have been a hindrance at every step. Some of the difficulties were described in a report of the UNRRA Mission after visits to several of the larger Ukrainian cities in May 1946.

"In our cable...we outlined the condition and needs of industrial plants in six principal Ukrainian cities visited by members of the Mission during May. The pattern is fairly uniform. Many plants were completely destroyed and those which still stood were usually heavily damaged and almost universally gutted of all modern equipment. Included among those industries hardest hit are the heavy capital goods industries, machine tool manufacturing industries, and power stations, as well as the rolling and stationary stock of all forms of transportation, and equipment for processing building materials. So great is

Coal: Plans for the Future

185 433 316 Under the Five-Year Plan, the coal industry of the Ukraine is to be speedily rehabilitated and further developed, so that by 1950 its output will be 86,100,000 tons, including about 6 million tons of brown coal (lignite).[1] When it is remembered that this target is only 2.3 million tons over 1940 production, the enormous task of rehabilitation confronting the industry is made clear. The difficulties are even more accentuated if one compares the increase of coal production in three pre-war years, from 1937 to 1940, when output leaped from 70 million tons to 85.8 millions.

Plans for increasing the future coal output of the Ukraine include not only the restoration of old mines but also intensive prospecting and the sinking of many new shafts.

"Between 1946-50, coal mines with an aggregate capacity of 77,500,000 tons are to be put into operation in the Stalino and Voroshilovgrad regions of the Ukrainian S.S.R.[2]"; and coal fields in other areas are to be further developed. In particular there are to be put into operation in the Donets Basin and in the western regions of the Ukraine, small coal mines and drifts with a total capacity of 4,600,000 tons of coal, and peat briquette plants with a capacity of 50,000 tons.

The lignite mining industry is to be developed and by 1950 is expected to supply annually some 6 million tons of coal. Five lignite mines operating in the Ukraine in 1946 increased their output in October by three times as compared with April.

935 654 Large coal supplies are expected from the regions west of the Dniepor, where 11 promising coal deposits are located. Prospecting is in progress there, as well as in the Zlochev, Krenenets, and Kolomya areas of Western Ukraine, where 28 shafts had been sunk by November 1946.[3]

Industrial lignite deposits have also been found in an area of four square miles between Slavgarod and Sinelhikovo (near Dniepropetrovsk) and in the Transcarpathian region.

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1 The coal output of the entire Soviet Union in 1950 is fixed at 250 million tons.

2 The Five-Year Plan, 1946-50

3 Soviet Monitor, London, November 21, 1946.

135 654 To the south-east, in the Don and northern Donets valleys, geologists have discovered a number of new coal-bearing areas, and have confirmed that the Donets Basin coal layers stretch far to the east and south.

Other investigations of coal-bearing areas are to begin shortly, particularly around the Azov Sea coast and in other regions bordering the Donets Basin.

Coke

316 The coke output of the Ukrainian S.S.R. in 1950 is planned to be 15,500,000 tons.

Natural Gas and Oil

315 182 With the incorporation of Western Ukraine in 1939, the Ukrainian S.S.R. came into possession of oil producing regions. The Five-Year Plan calls for the intensive development of these and other areas of the Ukraine for the increased production of oil and natural gas. Three hundred and twenty-five wells are to be located to add to the petroleum resources of the western regions; prospecting for commercial deposits of petroleum in the Rozny area is to be completed; and there is to be extensive geological exploration for natural gas in the Dragobych Region (Western Ukraine) and on the Azov and Black Sea coasts.

[654]

[382] The total output of petroleum in the Ukrainian S.S.R. in 1950 is fixed by the Five-Year Plan at 325,000 metric tons.

The plan also provides for the building of a gas pipeline from Dashava to Kiev. Already in process of construction, the first section of the pipeline will be completed this year (1947) and will supply gas to more than 30,000 flats and several large industrial plants in Kiev.

Electric Power Stations

377 Electrification has been one of the outstanding features of the Soviet economy. Before the war the Ukrainian Republic possessed a wide network of electric power stations. Best known was the huge Dnieper Dam and Lenin Hydro-electric Station, completed in 1932 near Zaporozhie. This station supplied electric power to a great industrial region: in the north the steel mills of Dniepropetrovsk and Dnieprodzerzhinsk, and to the south-east, the Nikopol manganese mines. These three industrial centres developed quickly after the Dnieper Dam was built; and the abundance of cheap power available from it also gave rise to the growth of a metal and machine-building centre at Zaporozhie.

Chemical Industry

The chemical industry of the Ukraine is based chiefly on coal deposits, but also on a number of other raw materials to be found there, including lacustrine deposits of sodium chloride (Artemovsk area) and phosphatic rocks (Konstantinovka area).

The Five-Year Plan fixes that:

"The chemical plants of the Ukraine, including soda, nitrate, and superphosphate plants, shall be rebuilt, and the potash mines in the regions of Stanislav and Dragobych, and a new superphosphate plant, a paint and varnish plant and a plastics factory built.

"In 1946-50 geological surveys shall be conducted with a view to locating commercial deposits of potassium salts to a total of 80 million tons, graphite to a total of 7.7 million tons, and gypsum to a total of 7 million tons."

Output in 1950 is fixed by the Plan as follows:

for the Ukrainian S.S.R.

Calcined soda	448,000 tons
Superphosphates	860,000 tons, and
Salt,	1,930,000 tons;

and for the entire Soviet Union:

Calcined soda	800,000 tons, and
Mineral fertilizers, superphosphates, nitrates and potash	5,100,000 tons.

Light Industry[1]

By the end of 1946 the production of consumer goods in the U.S.S.R. had already revived considerably; output in the different branches ranged from 20 to 50 per cent. above 1945. Reconversion of the factories to peacetime production was largely completed; however, three big tasks remained: to complete the rehabilitation of all light industry enterprises wrecked by the Nazis; to replace the old or worn-out machinery; and to obtain an adequate supply of labour and materials.

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1 Soviet News, London, December 30, 1946, and February 6, 1947.

361 is a wide boulevard bordered with beautiful flowers. Across the river,
341 to the left from a bridge, is a colourful little church in Russian style—a miniature replica of a Moscow *cerkev*—a piece of the Orient in a western setting. It is a delightful building coloured in dull red and white, and has a burnished cupola at the top which reflects the sun in a dazzling blaze. The interesting ikons in the interior match the fairy-tale beauty of its exterior. What a lively contrast to the dignified, twin-spired Greek Catholic cathedral and the surrounding ecclesiastical buildings on the opposite side of the river.

162 There are at least four religions in Užhorod, as well as in other
563 Ruthenian towns, and five languages are spoken there—Ruthenian, Czech, Slovak, Hungarian and Yiddish.

While Ruthenia has no mineral wealth comparable to that of
135 Slovakia, it supplies the entire Republic with salt. In the eastern tip
317 of the country, right on the Rumanian frontier, there are huge deposits of mineral salt in the neighbourhood of Slatinské Doly. Although only two mines are now being worked, the annual output amounts to about 120,000 tons of salt. The huge vaulted caves of these mines afford an imposing view from a gallery which rises at a considerable height above the bottom where the miners quarry large blocks of rock-salt, cut them into small blocks, and have them hoisted through the shaft to the surface. The mineral salt which is crushed in a salt-mill is only slightly impure and requires little cleaning.

317 Salt represents the mineral wealth of Carpathian Ruthenia. But it
263 is a commodity which the poor Ruthenian peasants and wood-cutters cannot afford. In order to spice their simple and meagre food the countryfolk journey a day or two to a pool of salt-water to fill a barrel with the liquid salt.

178 To appreciate the degree of progress Carpathian Ruthenia made
511 during the twenty years of its association with Czechoslovakia, one has
185 to bear in mind the condition of this forgotten country when it first appeared on the map as a political unit. The dire poverty, the low standard of education among the majority of the population, lack of cultural amenities, infectious diseases due to abominable sanitary conditions, inadequate communications, economic and political exploitation—all these factors made the life of the Ruthenians under the Carpathian mountains rather desolate.

President Masaryk once said that thirty years of peaceful, reasonable and energetic development would be needed to make the Czechoslovak State secure and happy. Carpathian Ruthenia certainly needed thirty, if not more, years of peaceful, reasonable and energetic development to emerge from her condition of poverty and primitiveness.

744 One of the worst evils was the appalling sanitary conditions in
164 Ruthenia. The rate of infant mortality was among the highest in

23: Shabad N-4 (no date) 1951 Rl Soviet Union Rl
Ukraine R.D.L

a long, warm autumn, provides excellent conditions for the development of agriculture. Average January temperatures vary from 27° F in the southwest to 14° F in the east, and July averages from 68° F in the north to 73° F in the south. The northern section of the Ukraine receives adequate rainfall (about 20 inches a year), but the south is much drier, having an average yearly rainfall of 9 inches. Most of the precipitation occurs in the first half of the year. During the summer, frequent violent rainstorms occur in the eastern sections.

The greater portion of the Ukraine lies in the wooded steppe and steppe zones, where black earth prevails. In the northern section, which lies in the forested zone, grassy marshes occur in abundance. In the wooded steppe zone the forest reserves have largely been depleted. Broad-leaved types, such as oak, maple, ash, and elm, occur only along the rivers and extend in green ribbons through gullies and ravines up to the watersheds. Characteristic local vegetation types are the dense growths of alder, willow, and poplar which border the inundated banks of the rivers and the many ox-bows and lakes which remain after the spring floods. The steppes on the watersheds have long been converted into rich wheat fields, a typical feature of the Ukrainian landscape.

Among the mineral resources which abound in the Ukrainian SSR, the primary raw materials for heavy metallurgy are most important. Scarcely anywhere else in the USSR are coal, iron, and manganese found within such proximity of each other as in the eastern Ukraine. The Donets Basin, or Donbas, with reserves of more than 90 billion tons, is the principal coal producer of the USSR. The Krivoy Rog iron mines produce iron ore of a high quality and metal content. Between these two sites are the rich manganese deposits in the area of Nikopol'. In the Donbas are extensive salt and mercury deposits. Petroleum fields lie in the foothills of the Carpathians, where salt, potash, and natural gas are also found. Another petroleum site is in the area of Romny (Sumy Oblast). The northern, marshy section of the Ukraine—Poles'ye—abounds in peat. Other minerals include polymetallic ores (Donets Basin), phosphorites, kaolin, limestone, marl, gypsum, and so forth.

The Ukraine is the most densely inhabited union republic of the USSR. Its 40 million inhabitants represent about one fifth of the total population of the USSR. The average population density is 180 per square mile; however, there is considerable variation throughout the region. The greatest concentration exists in the western Ukraine, along the foot of the Carpathians, where the density reaches 340 to 390 per square

23: Shabad N-4 (no date) 1951 R1 Soviet Union R1
Ukraine R01

major navigable through route of the Ukraine. The major ports are Zhdanov and Osipenko on the Sea of Azov, and Kherson, Nikolayev, and Odessa on the Black Sea. Odessa is one of the major maritime trade centers of the USSR.

The Ukraine exports coal, iron and steel, grain, salt, and sugar, and imports cloth from Moscow and Ivanovo, precision tools from Moscow and Leningrad, lumber from Gor'kiy Oblast, along the Volga, or from the Belorussian SSR along the Dnieper, petroleum products from Groznyy (by rail and pipe line) and from Baku (by sea via Batumi-Odessa), and fish from the Lower Volga.

Oblast Survey

The twenty-five oblasts of the Ukrainian SSR can be grouped into seven geographic regions on the basis of physical, economic, and historical factors: the right-bank and the left-bank sections of the wooded steppe, the Donets Basin, the Dnieper bend, the Black Sea lowland, the Ukrainian Poles'ye, and the Western Ukraine.

THE RIGHT-BANK WOODED STEPPE

The right-bank wooded steppe, which is the original settlement area of the Ukrainian people, includes the oblasts of Kamenets-Podol'skiy, Vinnitsa, and Kiev. Its fertile black-earth soils and the warm, humid climate have combined to turn the area into a region of intensive agriculture, a dense population, and a well-developed rail network. Sugar beets are the leading crop. Through careful tilling of the soil, the application of phosphate fertilizer, and the rotation with grains and forage grasses, high yields are obtained which furnish up to three tons of sugar per 2.5 acres. The principal grains are winter wheat, rye, barley, and oats. Leguminous crops (peas, lentils, beans) are extensively grown to restore soil fertility. In connection with the intensive crop cultivation, the raising of hogs and cattle for meat and milk production is also very important. Forage grasses and the by-products of the sugar-refining and associated distilling industries constitute an excellent feed supply. Also connected with the sugar economy of the area are the lignite and peat industries, which fuel the processing plants, the quarrying of limestone (used in the sugar-bleaching process), and the mining of phosphorite, which is converted into fertilizer.

23: Shabad N-4 (no date) 1951 R1 Soviet Union R1
Ukraine RD1

glass and soda works. A dense rail network and a unified power-transmission system connect the various enterprises. The vast number of urban centers, cities and workers' settlements, which have grown up around the metallurgical and machinery works and the coal mines, represent a concentration of almost one third of the urban population of the republic within 1/20 of its area.

Stalino Oblast

Area, 10,200, population, 3,000,000

Stalino Oblast includes the western section of the Dönets Basin, extending from the Sea to Azov in the south to the Northern Donets in the north. Agriculture (wheat, sunflowers, and cotton) is of importance only outside of the industrial section. Salt is mined near Artemovsk and mercury near Nikitovka. The principal coal-mining centers are Stalino, Makeyevka, Yenakiyevo, and Gorlovka.

Stalino, the largest city of the Donets Basin, had a population of 392,000 in 1948. It was originally called Yuzovo, or Yuzovka, for a Scottish industrialist, Hughes; it was called Stalin in the early part of the Soviet period. It has metallurgical, chemical, and coal-mining industries.

Makeyevka, a few miles northeast of Stalino, is the site of the Kirov metallurgical works, one of the largest of the Donbas, and coking installations. Coal mines operate in the suburban areas.

Yenakiyevo was called Rykovo from the 1920's until 1935, then Ordzhonikidze until 1943, when it again received its original name. It has a metallurgical industry, chemical works, and coal mines.

Gorlovka also has metallurgical, chemical, and coal-mining industries. Its northern suburb of Nikitovka has mercury mines and near-by Trudovaya is the terminus of an oil pipe line from the Groznyy fields in the Caucasus.

Konstantinovka has a metallurgical industry, zinc works, and produces ceramics, glass, and cement, as well as superphosphate fertilizer.

Kramatorsk is noted as a heavy-machine construction center which produces mining and metallurgical equipment. It also has railway-car repair shops and ceramics works. Druzhkovka, to the south, is another machinery center.

Slavyansk is a chemical center where there are salt mines and soda works, limestone quarries, and porcelain works. Artemovsk (formerly Bakhmut), to the southeast, is the center of an important salt-mining

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WESTERN UKRAINE

THE WESTERN UKRAINE includes those areas (except for Izmail Oblast) which were incorporated into the Ukrainian SSR after 1939 and later. Six oblasts (Rovno, Volyn', Ternopol', L'vov, Stanislav, and Drogobych) were annexed in the autumn of 1939 following the partition of Poland and the Soviet occupation of its eastern section. Chernovtsy Oblast was formed in the Northern Bukovina and the extreme northern section of Bessarabia after the acquisition of these territories from Rumania, in the summer of 1940. The Transcarpathian Oblast was ceded to the Ukraine according to an agreement with Czechoslovakia in 1945. The Western Ukraine can be roughly considered in four geographical sections: the Carpathian section in the south, on the slopes and in the foothills of the Carpathian Mountains, the Poles'ye, a northern lowland along the right affluents of the Pripet River, the hilly central section in the Volyn'-Podolian upland, and the Transcarpathian section.

The Carpathian section of the Western Ukraine includes the oblasts of Chernovtsy, Stanislav, and Drogobych. Its economy is based essentially on the mineral resources of the area: petroleum, natural gas, salt, and potash, and on the lumber resources on the slopes. There are a number of health resorts in the valleys.

Chernovtsy Oblast

Area, 3,200, population, 900,000

Chernovtsy Oblast lies along the upper Prut and the Dniester rivers. The forests (mainly beech), building materials, salt, and petroleum are found in the higher foothills. Agriculture puts the emphasis on grains (wheat, corn, and barley), potatoes and sugar beets in the south and on fruit growing along the Dniester, in the northeast. Sheep raising and lumbering are the main activities in the mountains. Sawmilling, woodworking, sugar refining, flour milling, and wine making are the chief rural industries.

Chernovtsy (Rumanian *Cernăuți*) called Chernovitsy until 1944, lies on a terrace above the Prut River. It has large textile and machine industries and produces chemicals, lumber, and food products.

Storozhinets (Rumanian *Storojineț*) is a road center in the agricultural region southwest of Chernovtsy.

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Khotin (Rumanian *Hotin*) lies in an orchard and vineyard area on the Dniester River. There is a noted leather industry.

Stanislav Oblast

Area, 5,400, population, 1,300,000

Stanislav Oblast is drained by the upper Dniester and its right affluents descending from the Carpathian Mountains. It has important petroleum, salt, natural-gas, and potash deposits in the areas of Dolina and Bolekhov, with petroleum fields extending along the foothills in a southeasterly direction to Kosmach, southwest of Kolomyya. The principal oil towns are Bolekhov, Dolina, Pereginsko, Bogorodchany (where ozocerite is also secured), Solotvin, Nadvornaya, Pechenezhin, and Kosmach. Petroleum is refined at Bolekhov, Stanislav, and Kolomyya. The main lumber centers are Delyatin and Kuty, which has a large wood-distillation industry. On the right bank of the Dniester River lies the agricultural zone of the oblast, where grains, tobacco, and sugar beets are raised. Tobacco is processed at Zabolotov and sugar at Gorodenka.

Stanislav (Polish *Stanisławów*, German *Stanislau*) has railroad and machine shops, an oil refinery, and textile and leather industries and produces asphalt, ceramics, lumber, and food products.

Kolomyya (Polish *Kołomyja*, German *Kolomea*), on the upper Prut River, has machine works and oil-refining and chemical plants. Textiles and cement are also produced.

Drogobych Oblast

Area, 4,000, population, 1,200,000

Drogobych Oblast lies on the northern slopes of the Carpathian Mountains and is bordered by Poland in the west. It is the chief petroleum region of the Western Ukraine, with the chief oil fields in the area of Drogobych and Borislav. Near by are potassium and magnesium salt mines and natural-gas wells. Salt is mined at Dobromil'. Agriculture is important along the Dniester River.

Drogobych (Polish *Drohobycz*) is the center of the Western Ukrainian petroleum region, with important refining and chemical installations and potash and magnesium salt mines. It trades in petroleum, livestock, and agricultural products and produces rubber goods, lumber, and food products.

Borislav (Polish *Borysław*) is another petroleum center southwest of Drogobych. It has petroleum and natural-gas wells and engages in the